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UML POINT MODEL FOR MOBILE GAME EFFORT ESTIMATION

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ABSTRACT

Mobile game continues to grow in the gaming industry. Due to its popularity and the emergence of 3D model, it demands richer, colourful and more advanced mobile components in order to deliver fun and long-term game play. This causes more complex range of functionality required to be included in the requirements and may lead to difficulties on accurate estimation of the effort of mobile game application. Software effort estimation is a backbone of software project. It estimates the number of person required, project duration and development cost. Functional size measurement is a widely accepted method in estimating the size of project and the software effort. However, the existing estimation models are designed before the emergence of mobile application. Therefore, there is possibility that these models unable to cater newer software technologies especially the mobile game application requirements. Additionally, the effort of mobile game can be very difficult to measure accurately since there is no standard procedure have been proposed especially in utilizing the concept of functional size to mobile game application. The estimation of mobile game can be varied by factors such as mobile platforms, devices or game requirements. Estimation based on requirements could produce precise results as it able to cater complex functionalities regardless to any programming code, technology or development process. UML Point is proposed as a functional size method for estimating the size of mobile game, which the obtained functional size can be used in the effort estimation activity. The proposed UML Point model integrates the concept of UML model and IFPUG Function Point Analysis. The utilization of both concepts leads to the transformation of the new set of procedure to assist practitioner specifically in mobile game effort estimation. UML model is used due to its ability to capture the complex functional requirements of mobile game, whereas IFPUG Function Point Analysis is adapted because it is capable in providing a precise estimation in many software projects. The input to the UML Point consists of use case diagram, component diagram, class diagram, sequence diagram and UML stereotypes for grouping certain elements in mobile game. The measurement procedure of UML Point is followed by the rules to map the concept of UML model into IFPUG Function Point Analysis. Three steps measurement procedure are proposed; count data function for component diagram, count data function for object interface and count transaction function. Besides, a software tool is developed with the objective to improve the accuracy of proposed UML Point. This study also reports the evaluation of UML Point. The proposed method has been validated to conform to three evaluation models; Technology Acceptance Model, Method Evaluation Model and ISO/IEC 14143 standards; with the aim to obtain participants' perception in terms of adoption of UML model in mobile game, the performance of UML Point and participants' perception in using the UML Point. The results showed that the proposed method produced more consistent assessment in terms of reproducibility and is more likely to be accepted in the practice for calculating the mobile game application development. However, the efficiency and accuracy of UML Point need to be revised. With respects to the perception in using the UML Point, the results showed that the acceptance of UML Point has higher acceptance value than IFPUG FPA. It concludes that UML Point have the potential as a model in estimating the effort of developing mobile game.

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